3-758-051-11 (1)

*CDU33A Double Speed Series*

# CD-ROM Drive Unit

*User's Guide*

# INFORMATION

You are cautioned that any changes or modifications not expressly approved in this manual could void your authority to operate this equipment.

Note: This equipment has been tested and found to comply with the limits for a Class B digital device, pursuant to Part 15 of the FCC Rules. These limits are designed to provide reasonable protection against harmful interference in a residential installation.
This equipment generates, uses, and can radiate radio frequency energy and, if not installed and used in accordance with the instructions, may cause harmful interference to radio communications. However, there is no guarantee that interference will not occur in a particular installation. If this equipment does cause harmful interference to radio or television reception, which can be determined by turning the equipment off and on, the user is encouraged to try to correct the interference by one or more of the following measures:

- Reorient or relocate the receiving antenna.

- Increase the separation between the equipment and receiver.

- Connect the equipment to an outlet on a circuit different from that to which the receiver is connected.

- Consult the dealer or an experienced radio/TV technician for help.

# OWNER'S RECORD

The model name and serial numbers are located on the Top side of the drive. Record these numbers in the space provided below. Refer to them whenever you call upon your sales representative regarding this product.

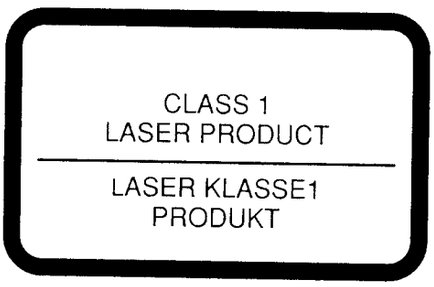
Model No._____ Serial No._____

# CAUTION

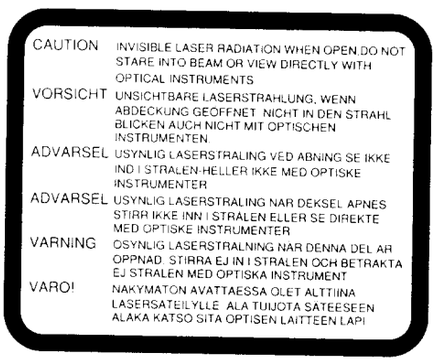
As the laser beam used in this CD-ROM drive unit is harmful to the eyes, do not attempt to disassemble the cabinet. Refer servicing to qualified personnel only.

This unit uses CD-ROM discs with the following mark.

When you use this unit as a CD player, use compact discs with the following mark.




This CD-ROM drive unit is classified as a CLASS 1 LASER product. The CLASS 1 LASER PRODUCT label is located on the top of the drive.


CAUTION INVISIBLE LASER RADIATION WHEN OPEN.DO NOT STARE INTO BEAM OR VIEW DIRECTLY WITH OPTICAL INSTRUMENTS
VORSICHT UNSICHTBARE LASERSTRAHLUNG, WENN ABDECKUNG GEOFFNET. NICHT IN DEN STRAHL BLICKEN AUCH NICHT MIT OPTISCHEN INSTRUMENTEN.
ADVARSEL USYNLIG LASERSTRALING VED ABNING SE IKKE IND I STRALEN-HELLER IKKE MED OPTISKE INSTRUMENTER
ADVARSEL USYNLIG LASERSTRALING NAR DEKSEL APNES STIRR IKKE INN I STRALEN ELLER SE DIREKTE MED OPTISKE INSTRUMENTER
VARNING OSYNLIG LASERSTRALNING NAR DENNA DEL AR OPPNAD. STIRRA EJ IN I STRALEN OCH BETRAKTA EJ STRALEN MED OPTISKA INSTRUMENT
VARO! NAKYMATON AVATTAESSA OLET ALTTIINA LASERSATEILYLLE. ALA TUIJOTA SATEESEEN ALAKA KATSO SITA OPTISEN LAITTEEN LAPI

This caution label is located on the top of the drive.

# Trademarks

- MS-DOS is a registered trademark of Microsoft Corporation.
- IBM PC, PC/XT, and PC/AT are registered trademarks of International Business Machines Corporation.
- HP Vectra is a registered trademark of the Hewlett-Packard Company.
- Molex is a registered trademark of Molex, Inc.
- AMP is a registered trademark of AMP, Inc.
- 3M is a registered trademark of the Minnesota Mining and Manufacturing Company.

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# Introduction

## Using This Guide

This guide is intended for users of the CDU33A series CD-ROM Drive Unit. It covers installation, connection, and operation of the drive.

This guide is divided into the following sections:

Introduction
Installing the drive
Operating the drive
Specifications

Read this guide thoroughly before attempting to use the drive.

## Features

The CDU33A series CD-ROM Drive Unit is an internal drive for installation in computers(IBM PC, PC/XT, PC/AT, HP Vectra or equivalent). The CD-ROM discs it reads can store as much as 540 Mbytes of digital data.

The drive unit offers the following features:

- 5.25 inch half-height drive form factor.
- Audio output to enable Audio CD playback
- Audio channel selectable by software(stereo, monoaural, reverse, etc.)
- Fast access time providing high-speed read operation.
- Real time layered error correction
- Manual loading and power ejection of discs.
- Emergency eject function for manual disc ejection
- CD-ROM XA and CD-I disc play

## System components

To configure a system featuring the CDU33A series drive, you require the following system components:

- Computer (IBM-PC, PC/AT, PC/XT, HP Vectra or equivalent)
- Host adaptor (recommended model:CDB-330 series ISA Interface Cards)
- Floppy disk drive
- Connecting cable

## Software requirements

To enable reading of the data stored on a disc, install the appropriate application software.

To read data from CD-ROM discs of the High Sierra Group (HSG) or ISO-9660 logical format, you can use Sony OPA-470 series MS-DOS CD-ROM Extensions. This software extends MS-DOS. It is designed for use with the IBM PC, PC/XT, and PC/AT.

# Location and Function of Controls

## ■ Front panel

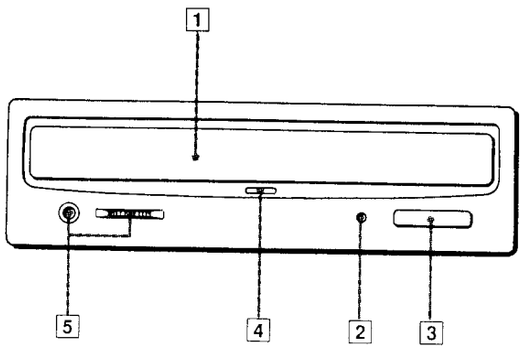



**Figure 1. Front View**

**1** Disc drawer
Accepts a CD-ROM disc on its tray.

**2** Emergency eject hole
Insert a rod here to eject the drawer manually.

**3** Eject button
Ejects the drawer from the drive unit.

**4** Busy indicator
Lights up while data is read from the disc; flashes during seek operations.

**5** Headphones jack and headphone level control
Connect headphones to the headphones jack and adjust the volume with this headphone level control.

## Rear panel

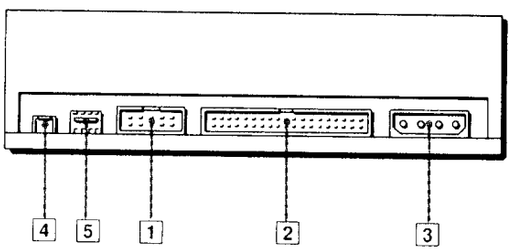



**Figure 2. Rear View**

1 Subchannel interface connector

Connects the CDU33A to the host adapter, which has subchannel signal processing capability, by using a connecting cable.

2 34-pin interface connector

Connects the CDU33A to the host adapter by using a connecting cable.

3 Power-in connector

Connects the CDU33A to the power supply within the computer.

4 Frame ground tab

Grounds the CDU33A to the host computer when the drive frame itself is not in direct contact with the computer.

5 Audio output connector

Refer to page 18 for details.

# Precautions

■ Installation

- Avoid placing the drive in a location subject to:
  —high humidity
  —high temperature
  —mechanical vibration
  —direct sunlight
- CDU33A can be used horizontally only.

■ Operation

- Do not move the drive while it is operating. Doing so may cause a malfunction to occur.
- Avoid exposing the drive to sudden changes in temperature. This may cause condensation to collect inside the drive. If the ambient temperature should suddenly rise while the drive is turned on, wait at least one hour before turning off the drive. If you attempt to operate the drive immediately after a sudden increase in temperature, a malfunction may occur during reading.

■ Transportation

- Keep the original packing materials to facilitate transportation of the drive.
- Always remove the disc before moving the drive. After removing the drive from the computer, repack the drive into its original packaging.

# Installing the Drive

This section describes how to install the drive into your computer.

Also refer to the manual supplied with your computer for details on how to install an internal drive unit.

## Before You Begin

Before installing the drive into the computer, perform the following:

1 Prepare the following tools and parts:
- a screw driver which is appropriate for your computer
- four screws which are 3 mm in diameter and which extend no more than 3.5 mm from the drive is surface
- two mounting rails if your computer is fitted with mounting tracks

2 Turn off the computer. Disconnect the computer's power cable from the AC outlet.
Disconnect all cables attached to the back of the computer.

**Caution**
To protect the drive and the computer from potential damage, do not power on the computer before installation of the drive has been completed.

## Removing the Computer's Cover

Remove the computer's cover as explained below:

1 The rear of your computer may be fitted with a plastic finisher panel. This is attached with plastic fastener strips. Remove this panel.

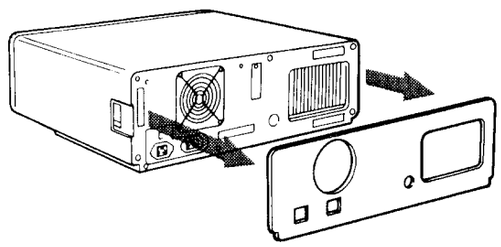


**Figure 3. Removing the Panel**

2 Remove the cover fixing screws.

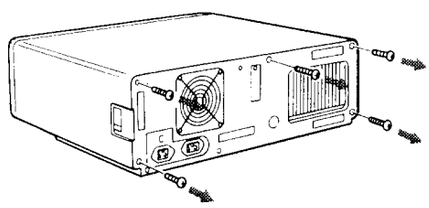


**Figure 4. Removing the Cover Fixing Screws**

3 Remove the computer's cover.

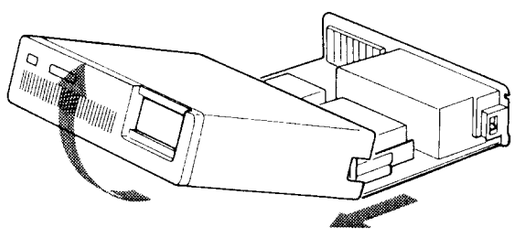


**Figure 5. Removing the Cover**

## Preparing a Slot for the Drive

Prepare a slot for the drive as explained below:

1 Remove the screws and brackets from the floppy disk drive's front panel.

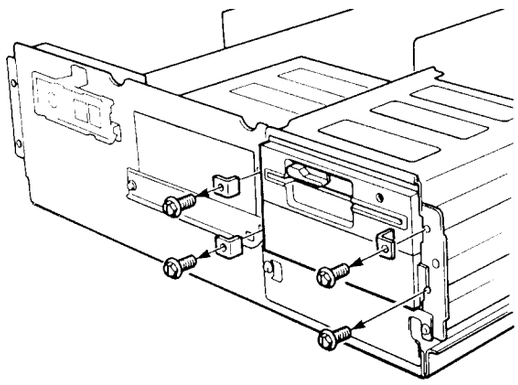


**Figure 6. Removing the Floppy disk Drive's Front Panel**

2 Disconnect the floppy disk drive.

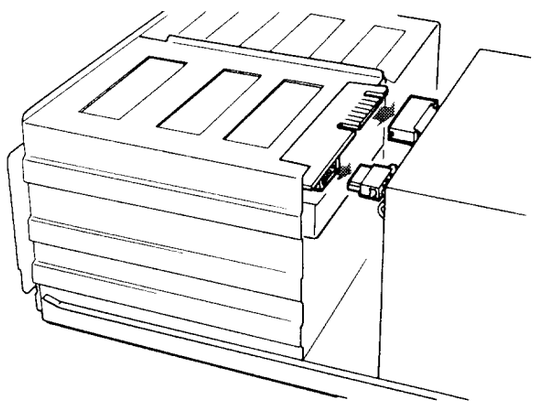


**Figure 7. Disconnecting the Floppy disk Drive**

3 Remove the floppy disk drive. Remove the blanking plate from the drive mounting slot below.

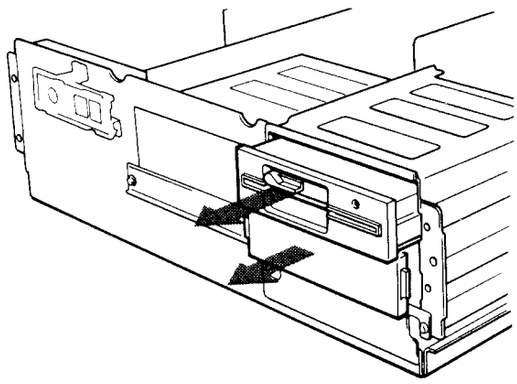


**Figure 8. Removing the Floppy disk Drive and the Blanking Plate**

## Mounting the Drive

**If mounting rails are necessary to install the drive**
Attach the mounting rails to the drive in the same way as they are attached to the floppy disk drive. Then, slide the drive into the lower half-height slot.

**If mounting rails are not necessary**
Secure the drive into the lower half-height slot using four screws you have prepared.

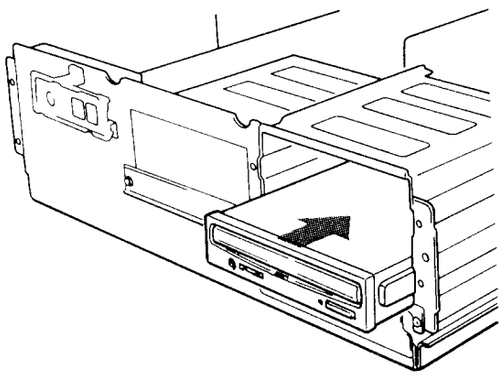


**Figure 9. Mounting the Drive**

## Connecting the Drive

Connect the drive to the computer using the following cables:

- Power cable
- Frame ground cable
- Audio cable (when connecting audio equipment)
- ISA interface cable

Each connection is explained below.

## ■ Attaching the power supply cable

Push the power supply cable connector firmly into the power-in connector. The recommended power supply cable is fitted with Molex 8980-3 contacts and a Molex 8981-4P housing.

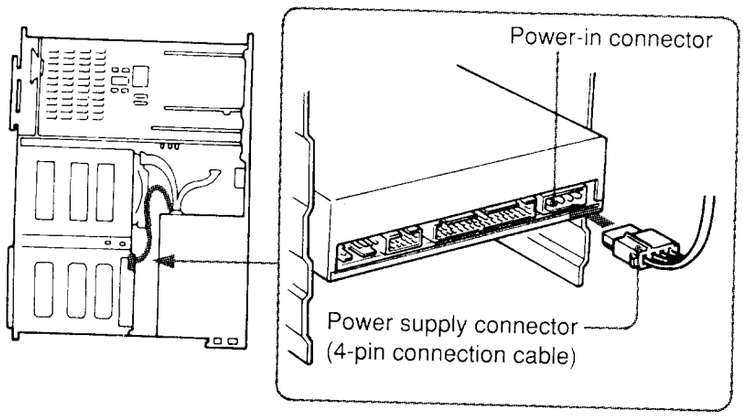



**Figure 10. Attaching the Power Supply Cable**

**Pin assignment**

The pin assignment of the power-in connector is as follows:

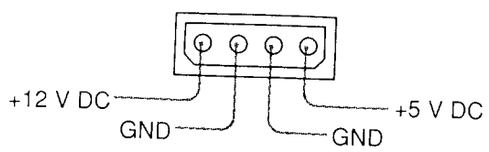



**Figure 11. Pin Assignment of the Power-in Connector**

## ■ Attaching the frame ground cable

If the drive is mounted using rails, there is no direct electrical contact with the host computer. Therefore, the drive must be ground with the frame ground cable.
Connect the computer's frame ground cable to the frame ground tab.
The recommended frame ground cable is fitted with AMP 170203-2 or 60711-1 contacts and an AMP 1-480435-0 housing.

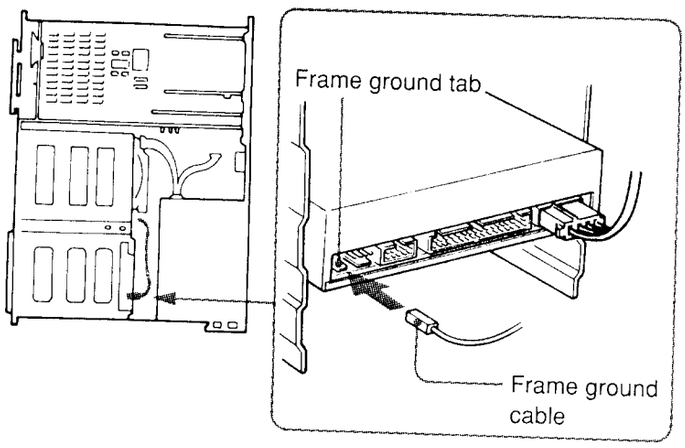



**Figure 12. Attaching the Frame Ground Cable**

## ■ Attaching the audio cable

When you intend to connect audio equipment, attach the audio cable to the drive and the host adapter.
The recommended audio cable is fitted with Molex 08-50-0113 or 08-50-0114 contacts and a Molex 22-01-3047 housing.
Attach the audio cable as follows.

1 Attach one end of the cable to the audio output connector.
The audio output connector recommended is Molex 08-50-0113 or 08-50-0114 contacts and a 22-01-3047 housing.

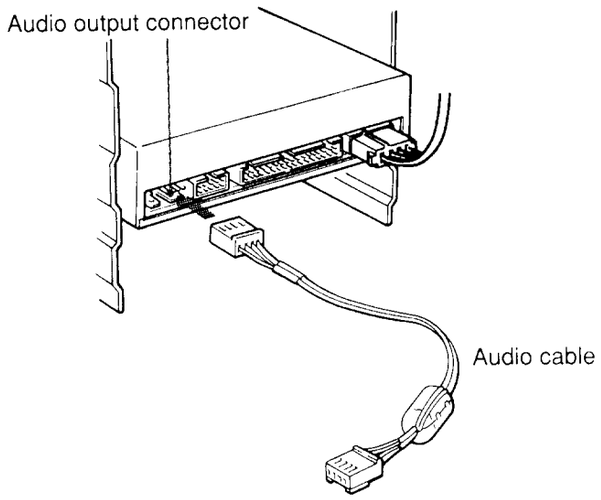



**Figure 13. Attaching the Audio Cable to the Audio Output Connector**

2 Attach the other end of the cable to the audio connector of the host adapter.

**Pin assignment**

The pin assignment of the audio output connector is as follows.

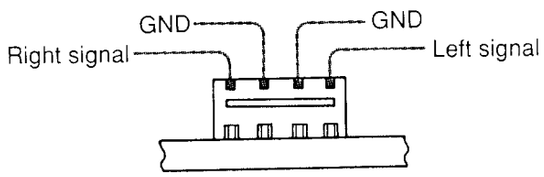



**Figure 14. Pin Assignment of the Audio Output Connector**

## ■ Attaching the ISA bus interface cable

Attach the ISA bus interface cable as follows:

1 Push one end of the cable firmly into the interface connector. For proper attachment, be sure to verify that the key of the cable connector is aligned correctly with the drive's interface connector.

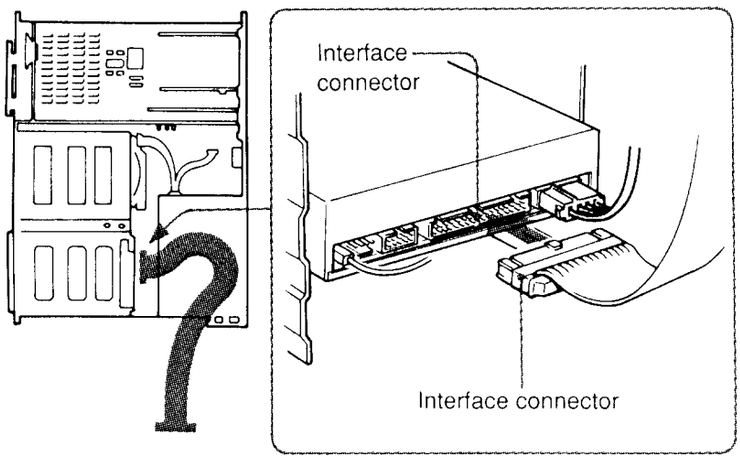



**Figure 15. Attaching the ISA bus interface Cable to the Interface Connector**

2 Attach the other end of the cable to the host adaptor. If necessary, see the manual supplied with the host adaptor.

## Mounting the Host Adapter

Mount the host adapter (recommended model: CDB-330 series) into an empty expansion slot.
Refer to the manual supplied with the host adapter for complete instructions on its installation and switch assignment.

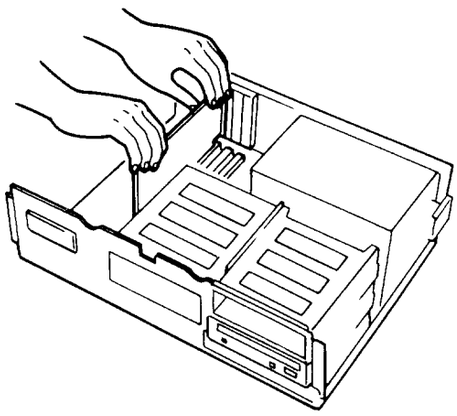


**Figure 16. Mounting the Host Adaptor**

## Reassembling the Computer

Reassemble the computer as explained below:

1 Reinstall the floppy disk drive in the top half-height slot.

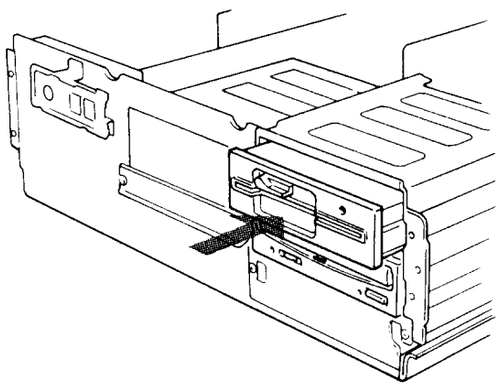


**Figure 17. Re-installing. Floppy Disk Drive**

2 Reconnect the floppy disk drive to the computer's interface connector.

3 Secure the floppy disk using the screws and the brackets you removed previously.

4 Tuck the cables behind the drives so that they do not protrude above the computer's power supply.

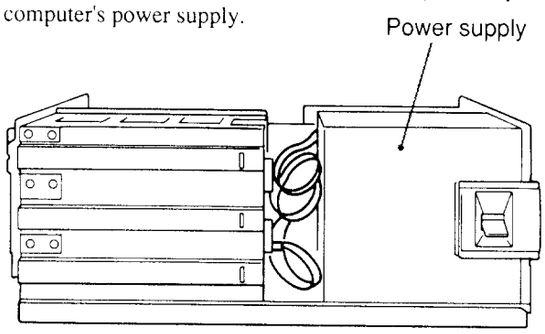



**Figure 18. Tucking the Cables behind the Drives**

5 Check the following before replacing the cover:
- Connections between the drive and the computer
- Jumper block settings

6 Fix the computer's cover using the mounting screws.

7 Replace the rear plastic panel if fitted.

# Operating the Drive

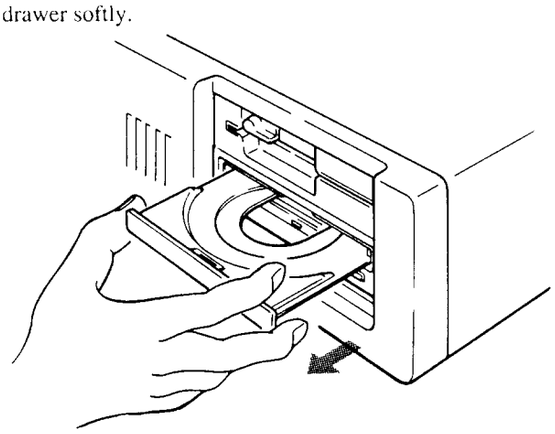
This section describes how to operate the drive. It also describes how to eject the drawer from the drive.

## Starting the Drive

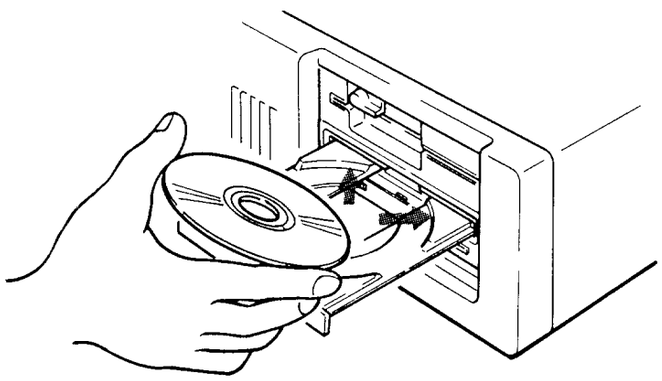
To start the drive, follow the procedure below:

1 Turn on the power supply.

2 Press the eject button. The drawer is ejected from the drive. Then, pull the drawer softly.



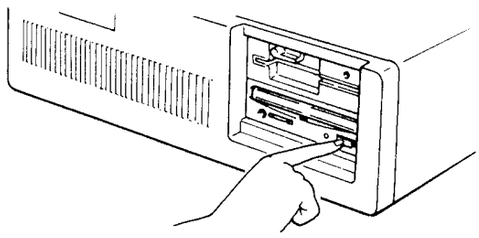
3 Place the disc in the drawer with the disc's label facing up. Then, restore the drawer softly until it is locked in the drive.



Note: CDU33A may not begin reading the Table of Contents (TOC) after disc insertion. This is dependent on the host computer's software control. This operation is similar to that of the floppy disk drive.

For an explanation of subsequent drive operations, follow the instructions provided with the application software.

To eject the drawer, press the eject button on the front panel.



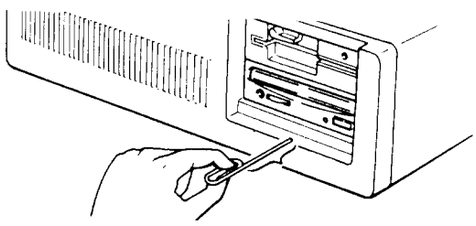
The eject button can be disabled by the computer. In such cases, pressing the eject button does not eject the drawer.

## ■ Ejecting the drawer manually in an emergency

To eject the drawer manually in an emergency, follow the procedure below:

1 Turn off the power to the drive unit.

2 Insert a 1.2 mm steel rod into the emergency eject hole and push.



# Specifications

## Disc

**Disc**

| | |
|---|---|
| Acceptable discs | CD-ROM mode-1 data discs<br>CD-ROM mode-2 data discs<br>CD-Audio discs<br>Audio-combined CD-ROM discs<br>CD-ROM XA discs<br>CD-I discs |
| Disc diameter | 12 cm, 8 cm |

**Rotational speed (varies from disc to disc)**

| | |
|---|---|
| Innermost track | 530 rpm at CLV = 1.4 meters/sec (normal speed)<br>1060 rpm at CLV = 2.8 meters/sec (double speed) |
| Outermost track | 200 rpm at CLV = 1.2 meters/sec (normal speed)<br>400 rpm at CLV = 2.4 meters/sec (double speed) |

## Drive Performance

**Data transfer rate**

| | |
|---|---|
| Sustained rate | 150 Kbytes/sec (normal speed)<br>300 Kbytes/sec (double speed) |
| Burst rate | 2 Mbytes/sec |

**Access time (typical)**

| | |
|---|---|
| Full stroke | 0.66 sec (normal speed)<br>0.52 sec (double speed) |
| Average (random) | 0.46 sec (normal speed)<br>0.32 sec (double speed) |

## Reliability

**Read error rate (includes 5 retries)**

| | |
|---|---|
| L-EC on | 1 Block/$10^{12}$ bits (typical) |
| L-EC off | 1 Block/$10^{9}$ bits (typical) |

## Audio

**Output level**

| | |
|---|---|
| Line output | 0.7 V at 47 KΩ |
| Headphone output | 0.5 V at 32 Ω |

## Environment

| | |
|---|---|
| **Operating** | |
| Temperature | 5°C to 50°C (41°F to 122°F) |
| Humidity | 10% to 90% |
| Absolute humidity | 30 grams/$m^3$ |
| | (max wet bulb temperature: 29°C) |
| Atmosphere | Noncondensing |
| **Non-operating/Storage** | |
| Temperature | –20°C to 50°C (–4°F to 122°F) |
| Humidity | 10% to 90% |
| Atmosphere | Noncondensing |
| **Vibration** | |
| Operating | 0.2 $G_{0\text{-}p}$ at 5 Hz to 300 Hz |
| Non-operating | 2 $G_{0\text{-}p}$ at 5 Hz to 300 Hz |
| Transportation | 0.015 $G^2$/Hz at 5 Hz to 50 Hz |
| | (with standard package) |
| **Damage Boundary** | 65 ips/40 G |

## Dimensions and Weight

| | |
|---|---|
| Dimensions | Approx. 146 × 41 × 178 mm (w/h/d) |
| | ($5^3/_4 \times 1^5/_8 \times 8$ inches) |
| Weight | Approx. 0.8 Kg (1 lb 12 oz) |

## Power Requirement

| | |
|---|---|
| Voltage | +5 V DC ± 5% and +12 V DC ± 10% |
| Ripple | +5 V: 0.05 Vp-p at 250 mA |
| | +12 V: 0.1 Vp-p at 500 mA |
| Current | +5 V: 200 mA at Read |
| | 600 mA at Seek |
| | +12 V: 280 mA at Read |
| | 1200 mA at Seek or Spin-up |

## Connectors

| | |
|---|---|
| Power-in connector | Molex 53109-0410 or equivalent |
| Interface connector | 3M J3594-5002 or equivalent |
| Subchannel connector | 3M J3654-5002 or equivalent |
| Audio connector | Molex 5046-04A or equivalent |

## Laser

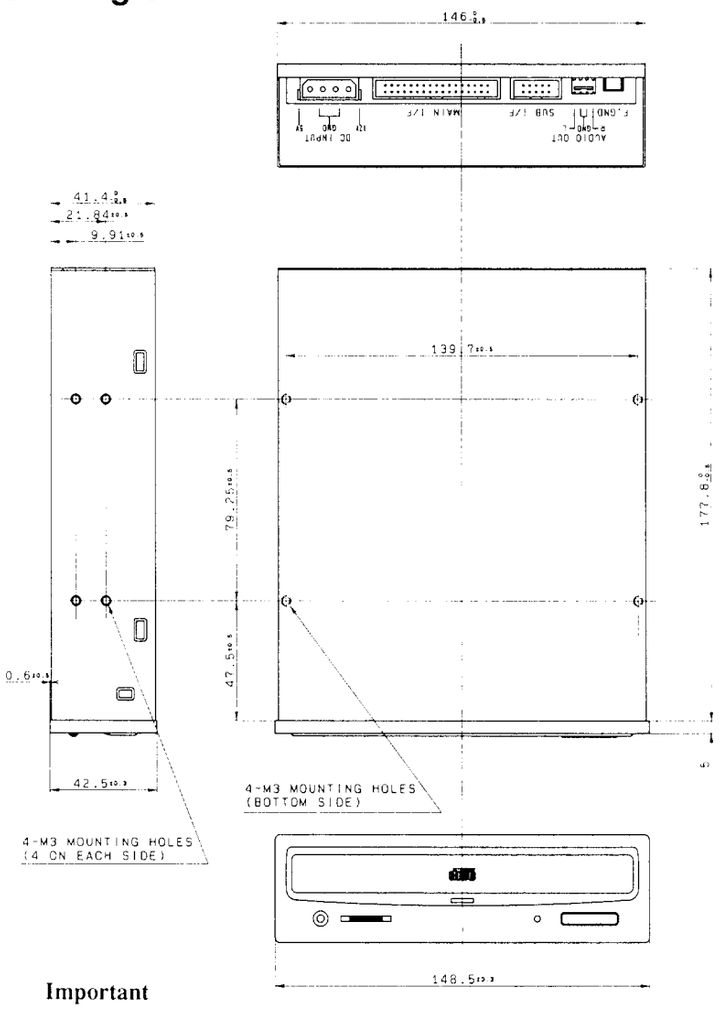
| | |
|---|---|
| Type | Semiconductor laser GaAlAs |
| Wave length | 780 nm |
| Output power | 0.6 mW |

## Optional Accessories

| | |
|---|---|
| CD-ROM discs | YHDS-50 "CD-ROM Test Disc Type 1.3" (equivalent to YHDS-4)<br>YHDS-100"CD-ROM Test Disc Type 2.0" (audio-combined) |
| Host adapter | CDB-330 series for IBM PC, PC/XT, PC/AT, HP Vectra or equivalent |
| Interface software | Sony MS-DOS CD-ROM Extensions OPA-470 series for IBM PC, PC/XT, PC/AT, HP Vectra or equivalent |

Design specifications are subject to change without notice.

## Dimension Diagram




**Important**

Screw overhang should not exceed 3.5 mm from the surface of the side panels or the bottom plate.